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New Species of *Inoceramus*-like Bivalves of the Subfamily Kolymiinae from the Middle Permian of Northeastern Asia

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Abstract—Middle Permian *Inoceramus*-like bivalves of the genera *Kolymia* Licharew and *Cyrtokolymia* Astafieva endemic to the East Boreal Biogeographic Realm are considered. *Cyrtokolymia*, previously regarded by the author as endemics of the Verkhoyansk–Okhotsk Province and including only the type species, are also recorded in the Kolyma–Omolon Province, where they are represented by the endemic species *C. bobini* sp. nov. An emended diagnosis of the genus *Cyrtokolymia* is provided. The genus *Kolymia* comprises about 30 species. The greatest diversity of *Kolymia* (24 species, 13 of which are endemic) is known from the Verkhoyansk–Okhotsk Province, which is the center of diversification of this genus. The Kolyma–Omolon Province is characterized by 12 species, only three of which are endemic. In other provinces of the East Boreal Realm, only individual members of *Kolymia* are known. From the Middle Permian of the Omolon Massif, northern Verkhoyansk Region, and Penzhinsky Ridge, the following new species are described: *Kolymia posneri* Muromzeva, Kusnezov et Biakov, sp. nov., *K. pontoneica* Biakov, sp. nov., *K. simkiniformis* Biakov, sp. nov., and *Cyrtokolymia bobini* Biakov, sp. nov.

Keywords: Inoceramus-like bivalves, new taxa, Middle Permian, Northeast Asia

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INTRODUCTION

The middle of the Permian Period (Roadian and Wordian) in northeastern Asia is characterized by flourishing of a rather peculiar subfamily of Permian *Inoceramus*-like bivalves, the Kolymiinae Kusnezov and, especially, the genus *Kolymia* Licharew endemic to the East Boreal High-Latitude Biogeographic Realm. Having appeared at the beginning of the Roadian, this genus completely dominated benthic communities of the Verkhoyansk–Okhotsk and Kolyma–Omolon provinces up to the end of the Wordian, and suddenly disappeared at the beginning of the Capitanian in connection with a large extinction, which involved all groups of the Permian biota (Biakov, 2012a).

The flourishing of *Kolymia,* which led a semiburrowing mode of life, was probably promoted by wide development in the mid-Permian of northeastern Asia of extensive relatively shallow basins with peculiar environments, possibly having chemotrophic supply, (Ganelin et al., 2010), and specific carbonate sedimentation, which resulted in the formation of rather peculiar rocks, i.e., kolymic (atomodesmic) limestones. Apart from rare brachiopods (rhynchonellids and linoproductids) and some pectinoid bivalves, these rocks enclose only Kolymiidae, frequently forming accumulations, such as banks.

To date, about 30 species of the genus *Kolymia* have been established; they mostly inhabited the Verkhoyansk–Okhotsk (24 species, including 13 endemics) and Kolyma–Omolon (12 species, three endemics) provinces. The Verkhoyansk–Okhotsk Province was apparently the center of diversification of this genus, as confirmed by the earlier records of presumable ancestors of *Kolymia,* members of the genus *Praekolymia* Biakov, the first finds of which were described from the Kungurian of the western Verkhoyansk Region (Biakov, 2008).

In other provinces of the East Boreal Realm, only individual members of *Kolymia* are known; one species occurs in the Novaya Zemlya Archipelago (*Kolymia inoceramiformis* Licharew) and two (*K. plicata* Biakov and *K. multiformis* Biakov) are known in the Mongol–Transbaikalian Province. Recently, owing to the collections of S.B. Shishlov, A.B. Kuzmichev, and M.K. Danukalova, *Kolymia* has also been revealed in the Taimyr Province, where it is represented by the species *K.* ex gr. *nikolaewi* (Voronez) and *K.* cf. *inoceramiformis* Licharew.